

# MATERNAL EXPOSURE TO DESINFECTION BY- PRODUCTS DURING PREGNANCY AND MICRONUCLEI IN MATERNAL AND CORD BLOOD LYMPHOCYTES

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**Background and Aims:** Exposure to disinfection by-products (DBPs) in drinking water has been associated with cancer risk in adults. We evaluated maternal exposure to DBPs in relation to micronuclei (MN) frequency in mother and newborns. MN are formed as a result of chromosome breakage or loss and are a marker of genetic instability. High levels of MN have been associated with increased cancer incidence in adults.

**Methods:** The mother-child birth cohort in Crete enrolled 1359 women at the third month of pregnancy. Effects on DNA were assessed in lymphocytes from 218 maternal and 239 umbilical cord blood samples, collected at birth, by the cytokinesis-block MN assay. Information on personal water related habits was obtained from questionnaires administered during pregnancy. Tap water samples were collected in representative mother homes, and were analysed for major DBPs including trihalomethanes (THMs). Negative binomial models were used to examine the association between MN in mothers and newborns with estimates of DBP exposure.

**Results:** A high percentage of women reported using bottled water during their pregnancy at home (72%) and outside of their home (98%). Exposures to THMs in tap water were found to be low (<20 micrograms/L) and were primarily brominated (BR) compounds. A strong positive association ( $p=0.004$ ) was observed in univariate analysis between MN in binucleated cells from the mother's blood and THM or BR levels in tap water. This association was weaker but remained significant ( $p=0.02$ ) after adjustments for maternal age and other potential confounders. MN in the children was not found to increase with any measures of THM exposure.

**Conclusion:** Findings from this study suggest a potential impact of DBP exposures on the frequency of MN in mothers but not in newborns. Exposures to DBPs were very low in this cohort, which may explain the lack of positive findings in children.